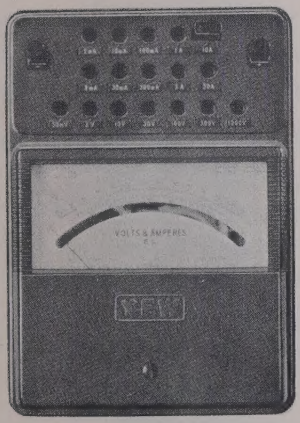
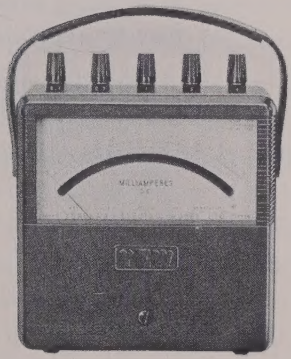
Type 2011, 2012
Type 2013, 2014

INSTRUCTION MANUAL





PORTABLE STANDARD AMMETERS & VOLTMETERS

YOKOGAWA

INSTRUCTIONS

REFERENCE TABLE ON OLD AND NEW TYPE NUMBERS

Name of Instrument	New Type Number
Portable Standard DC Ammeters & Voltmeters	2011
	2012
Portable Standard AC Ammeters & Voltmeters	2013
	2014
(2050-Series) Miniature Portable DC & AC Ammeters & Voltmeters	2051
	2052
	2053

PORTABLE STANDARD AMMETERS & VOLTMETERS

DC AMMETERS & VOLTMETERS Types 2011 & 2012
AC AMMETERS & VOLTMETERS Types 2013 & 2014

1. GENERAL

Taut band suspension system is adopted in all the YEW Portable Standard DC & AC Ammeters and Voltmeters. Without pivot and jewel bearings, these portable standards are free of friction and thoroughly resistant against shock and vibration. The characteristics conform with the requirements for class 0.5 or 1.0 of the Japanese Industrial Standard JIS C 1102. These instruments are prominent in excellent reliability and negligible deterioration with time.

2. DIRECTIONS FOR OPERATION

2.1 Common Directions for Types 2011 through 2014

(1) Place the instrument on a fairly level surface. Horizontal position will give the highest accuracy.

(2) Check that the pointer perfectly coincides with the zero-point before measurement. If not, turn the zero adjusting screw provided on the meter cover until the pointer meets the zero-point exactly.

(3) To maintain the accuracy of the instrument, select an adequate measuring range so that the indication may be read in the scale span from the rated value down to the half of it.

(4) Be careful not to apply an unreasonably large current or high voltage to the instrument.

(5) Avoid wiping the surface of the glass window of the instrument with a dry cloth during measurement. If wiped, a deviation in indication may occur due to the static electricity. To remove this, breathe upon the glass window.

2.2 Directions for Types 2011 and 2012

(1) These instruments are of moving coil type to be used only for DC measurement.

(2) The instrument, therefore, indicates mean value if a current of rectified wave, such as a pulsating current, is measured.

(3) For DC current measurement using Type 2011 (50mV) or Type 2012 (50mV terminal is to be used) in conjunction with an external shunt Types 2215 through 2217 (SHA-50B), use a pair of connecting lead wires provided (length: 1.5m, resistance: 0.025 Ω X 2). In case these leads are not available, use a pair of any lead wires whose total resistance is less than 0.1. Ω .

(4) When measuring a voltage higher than 1000V, use the 3V instrument provided with an external voltage-multiplier, use either Type 2222 (BX-3A) or 2223 (BX-5A) voltage multiplier, to which the 3V-terminal of the instrument is connected.

2.3 Directions for Types 2013 and 2014

(1) These instruments are of moving iron type to be used for measuring AC current or voltage of commercial frequency.

(2) The indication error of the instrument is very small for distorted wave alternate current. In case of distorted wave including 30% third harmonic, the error is within 0.2%.

(3) The 4-range ammeter and 13-range volt-ammeter are provided with built-in current transformer or potential transformer. Please note that in the measurement of AC including DC component, these instruments do not indicate the DC component at all, but cause a considerable amount of indication error due to DC magnetization in the transformer. In such a case, use of ammeter or voltmeter of 2-range type is recommended.

(4) The instrument is magnetically shielded. However, during measurement, keep the instrument away from cable or bus in which a large current flows. Please note that the indication may vary by 0.3% maximum when the instrument is used at a distance of 1m from a straight leadwire through which 1000A current flows.

(5) To measure a current larger than 100A, the 5A instrument provided with an external current transformer should be used. Or, any one of the current transformers Types 2241 (CT-90), 2242 (CT-90B), 2243 (CT-9) or 2244 (CT-101) should be externally connected to the 5A-terminal of the instrument used.

(6) To measure a voltage higher than 750V, the 150V instrument provided with an external potential transformer should be used. Or, any one of the potential transformers Types 2261 (PT-1) and 2262 (PT-1B) should be externally connected to the 150V-terminal of the instrument used.

(7) When using a current transformer or a potential transformer, connect its secondary side to the ground.

(8) During use of a current transformer, be sure not to open the secondary circuit because dangerous high voltage may be induced in the secondary winding. When changing the instrument, do it after short-circuiting the secondary terminals of the current transformer, or after closing its short-circuit switch when the transformer is provided with such a switch.

3. MAINTENANCE

(1) If an overload or excessive shock is caused on the instrument and the accuracy of the instrument is considered doubtful, check several scale points with the aid of other instrument which has been properly calibrated.

If the accuracy of the instrument is found not as rated, readjust the instrument.

(2) After measurement, keep the instrument free of dust, moisture and direct sunlight.

STANDARD RATING

DC Ammeters and Voltmeters Types 2011 & 2012

Type	Maximum Scale Value	Approximate Internal Resistance or Voltage Drop
2011	*3/10/30/100 μA *10/30/100/300 " 0.1/0.3/1/3 mA 1/3/10/30 " 10/30/100/300 " 0.1/0.3/1/3 A 1/3/10/30 "	5.1/18.3/7.7/2.5 kΩ 6.8/6.8/3.5/0.88 " 750/750/ 78/97.5Ω 23/14/4.7/1.6Ω Voltage Drop: 50mV
	0.3/1/3/10 V 3/10/30/100 " 30/100/300/1,000 "	1 mA (1,000Ω/V)
2012	3/10/30/100/300/1,000V 1/3/10/30/100/300mA 1/3/10/30A 50mV (17 ranges)	Voltage measuring range: 1mA (1000Ω/V) Current measuring ranges: 50mV 59Ω 300mA 51mV 1mA 24mV 1 A 53 " 3 " 41 " 3 " 56 " 10 " 47 " 10 " 75 " 30 " 49 " 30 " 100 " 100 " 50 "
2011	for use with external shunt (50mV)	(500 μA)
	for use with external voltage multiplier (3V)	(1mA)

Note: 1. "*" mark indicates the instrument of 1.0% accuracy.

2. Types 2011 (50mV) and 2012 are supplied with a pair of lead-wires (1.5m, 0.05Ω) for connecting the shunt.

Type	Maximum Scale Value	Approximate Volt-Ampere Loss
2013	20/100 mA 50/250 " 100/500 " 0.2/1 A 0.5/2.5 " 1/5 " 2/10 " 5/25 " 10/50 "	0.3/0.2 VA 0.5/0.5 " 0.5/0.5 " 0.4/0.4 " 0.5/0.5 " 0.6/0.6 " 0.7/0.7 " 1/1 " 1.2/1.8 "
	20/50/100/200 mA 0.1/0.2/0.5/1 A 0.5/1/2/5 " 2/5/10/20 " 10/20/50/100 "	0.4/0.3/0.2/0.3 VA 0.2/0.3/0.4/0.5 " 0.7/0.6/0.5/0.3 " 0.5/0.3/0.6/0.9 " 0.6/0.9/1.7/2.4 "
	15/30 V 30/75 " 75/150 " 150/300 " 300/750 "	3.8 VA
2014	30/75/150/300/ 750V, 0.15/0.3/ 0.75/1.5/3/7.5/15/30A (13 ranges)	voltage measuring range: 4.5VA current measuring ranges: 7.5A and below 0.7VA 15A 0.9VA 30A 2 VA
2013	for use with external CT (5A)	0.22VA
	for use with external PT (150V)	3.75VA

"2050-Series" Miniature-Size Portable instruments are also available as sister of the Portable Standard Instruments. The "2050-Series" instruments are of high precision and compact in size, designed ideal for use in experiments, researches, production lines, and other applications. For technical information and prices, please contact YEW home office in Tokyo, Japan or the nearest YEW representative.

YOK

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